XLV.—*On Hexactinellid Spicules and their Names.*—Part II. *Supplementary.* By R. Kirkpatrick.

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In the 'Annals' for Feb. 1910 I sketched out a classification of Hexactinellid sponge spicules on a morphological basis. In the paper referred to it was stated that all Hexactinellid spicules could be arranged in two groups, viz. Holactine spicules without end-spines or distal appendages to their actines, and Astral spicules with end-spines or distal appendages at the end of the actines. In the present paper attention will be called to certain spicules which are undoubtedly holactine, but which have spines at one end of the ray. In spite of this fact these spicules do not belong to the astral group, for the spines are not end-spines or distal appendages. The spicules with these seemingly paradoxical characters are the clavulæ, scopulæ, and certain root-tuft spicules such as are found in *Hyalonema*.

The scopulæ, which are orientated more or less vertically at the dermal and gastral surfaces of certain Dictyonine sponges, are slender rods with two or more prongs projecting from the outer or surface end of the spicule. The axial canal extends the whole length of the rod, but the prongs are solid. Under a high power and with good light it is not difficult to see an axis cross—already figured by Schulze—in the usually swollen end whence the prongs emanate. Accordingly the scopula is a micromonactin with five aborted actines, the central or basal end of the rod being the end with the prongs. The *distal* or apical end, which is situated in the interior of the sponge, has no end-spines or distal appendages. Consequently the scopula is holactine and not astral. From the morphological point of view it is desirable to call appendages situated at the central end of monactine spicules by some distinctive name in contrast with such terms as "end-spine" or "distal appendage," and I suggest the designation "centrospine." Similarly the disks of clavulæ may be termed centrodisks as compared with the distal disks of amphidisks. For clavulæ likewise are micromonactins in which the axis-cross can be seen in the disk at the central end of the spicule. Of course it may be urged that anything beyond the point where the axial canal of the persisting actine joins the axial canals of the aborted actines should be regarded as belonging to the territory of the latter, and that the designation centrospine is not correct. The term is merely

suggested, however, to emphasize the fact that the distal end of the clavula or scopula is wholly devoid of end-spines or distal appendages.

The forms of the clavulæ and scopulæ present the same kind of contrast as that existing between amphidisks and hexasters. The distinction is purely a morphological one, however, for both clavulæ and scopulæ are found together in *Claviscopulia intermedia*, F. E. Sch. In the case of the amphidisks and hexasters the distinction is significant from the phylogenetic as well as the morphological point of view. Amphidisks and hexasters are astral, and clavulæ and scopulæ are holactine spicules. The latter belong to the subgroup of micromonactins, a category which should be placed below the microhexactins in the morphological scheme ('Annals,' *l. c.* p. 209).

The root-tuft spicules of *Hyalonema* are mega-monactins with centrodisks. Here again there are no end-spines at the true distal end of the spicule.

The remarkable uncinates with their highly specialized lateral spines are diactins, which should, I think, in spite of their large size, be classed as microscleres. Accordingly they would come under the category of microdiactins.

I take this opportunity of making a correction. In a paper "On the Phylogeny of the Amphidiscophora" ('Annals,' Nov. 1909, p. 479) I wrote:—"What appears to be a second character"—in Amphidiscophora—"is the existence of genuine microhexactins, which do not exist, so far as I have observed, in the Hexasterophora. (The small hexactins forming part of the framework in Dictyonine sponges are not here regarded as microhexactins)."

I have now found in certain Dictyonine sponges (*Eurete semperi*, F. E. Sch., &c.) microhexactins which could not be regarded as loose spicules which would later be welded so as to form part of the dictyonal framework. Accordingly the name Microhexactinophora could not be used as an alternative name to Amphidiscophora. Microhexactins seem to have entirely disappeared, however, from many Lyssacine sponges, in which the seeming hexactins are hexasters.

The hexasters in Dictyonine sponges are frequently of a primitive type, *i. e.* the actines are relatively long and the end-spines often little more than short thorn-like prickles; in more highly evolved hexasters the actines tend to become shorter and the end-spines longer, more curved, and tipped with toothed disks.

The total disappearance of microhexactins from so many of the Hexasterophora is surprising in view of the fact that

in numerous species the holohexasters tend to become reduced to monohexasters which simulate the simple hexactin form.

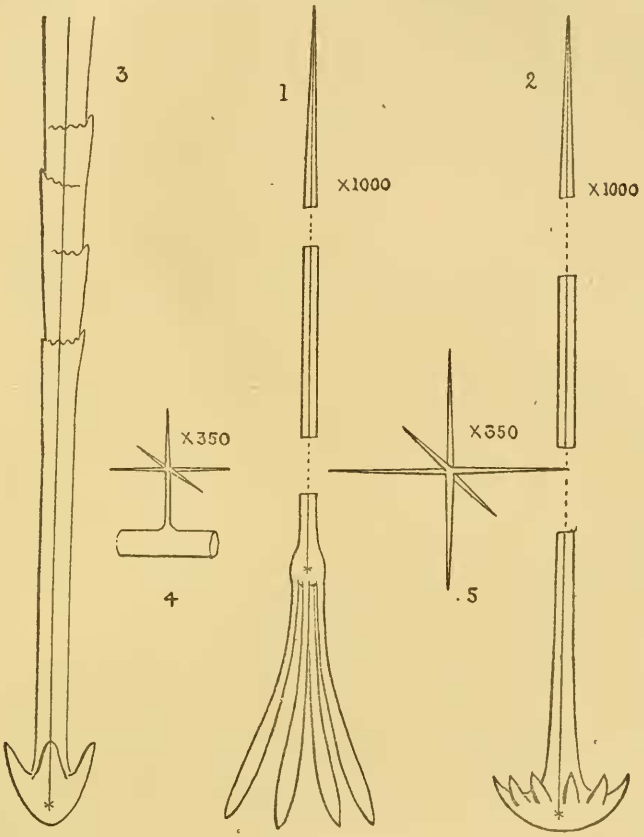

Fig. 1.—Scopula of *Eurete semperi*, F. E. Sch., a holactine monactin with prongs or spines at its central end, but without end-spines at the distal or peripheral end, with axis cross at central end. Examined in glycerine. Camera lucida drawing, × 1000.

Fig. 2.—Clavula of *Farrea occa* (Bowerbank), Carter. In glycerine. Camera lucida drawing, × 1000.

Fig. 3.—Root-tuft spicule of *Hyalonema sieboldii*, Gray, a holactine monactine megasclere. Magnified.

Fig. 4.—A small hexactin of *Eurete semperi*, F. E. Sch., welded on to the dictyonal framework. × 350. After F. E. Schulze.

Fig. 5.—A loose hexactin of *E. semperi*, F. E. Sch. × 350. After F. E. Schulze.

Often it is obvious that monohexasters are reduced holohexasters, because the end-spine of the former resembles each

one of a tuft of end-spines of the latter both in form and in position relatively to the actine.

The fact that occasionally microhexactins are found in Hexasterophora does not invalidate the theory that the distinctive features of Amphidiscophora and Hexasterophora may have been due to the running together, at an early stage, of the trabeculæ into strong surface laminæ in the former and not in the latter, thereby bending down the plastic end-spines of the reduced hexaster scleroblasts and giving rise to amphidisks.

Summary.—Clavulæ and scopulæ are holactine micromonactins, and it is suggested that their spines and disks should be termed centrospines and centrodisks, to distinguish them from the true end-spines and end-disks at the distal end of the actines of astral spicules.

Microhexactins, which were stated by me not to be present in Hexasterophora, occur in certain dictyonine species, but appear to be entirely absent from most of the Hexasterophora.

XLVI.—*A new Chinese Mole of the Genus* Scaptochirus.

By Oldfield Thomas.

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The British Museum has received from Mr. R. Gillies, of the Chinese Inland Mission, a mole of the genus *Scaptochirus*, and its examination shows not only that it is itself new, but that the species which I described in 1881 as *Talpa leptura* is after all a distinct species, and not an example with abnormal dentition of *S. moschatus*, as has been recently assumed.

Scaptochirus gilliesi, sp. n.

Size rather smaller than in *S. moschatus*, markedly smaller than in *S. lepturus*. Colour a darker shade of "broccoli-brown," that of *S. lepturus* paler brown, though this latter may be due to fading. Tail well-developed, almost naked, about as long as in *S. lepturus*, much longer than in *S. moschatus*, in which it is said scarcely to project beyond the fur and to measure less than a centimetre.

Skull apparently slightly smaller than in *S. moschatus*, much smaller than in *lepturus*, its middle region less narrow